



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/965,929	09/28/2001	Robert W. Byren	PD-00W129	4201

23915 7590 11/19/2003

PATENT DOCKET ADMINISTRATION
RAYTHEON SYSTEMS COMPANY
P.O. BOX 902 (E1/E150)
BLDG E1 M S E150
EL SEGUNDO, CA 90245-0902

EXAMINER

THOMAS, COURTNEY D

ART UNIT PAPER NUMBER

2882

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/965,929

Applicant(s)

BYREN ET AL.

Examiner

Courtney Thomas

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: The reference numerals appearing in Fig. 1 are not fully disclosed in the specification.

Appropriate correction is required.

Claim Objections

1. Claims 1, 2 and 21 are objected to because of the following informalities:

2. Claim 1 recites: "... Means for generating a *first beam* of electromagnetic energy; ... said fourth means including adaptive optical means for generating a phase conjugate laser beam *as said first beam*." (Emphasis added). Examiner notes that a recitation of the properties of the first beam, created by the generating means, does not provide an antecedent basis for the phrase: a phase conjugate laser beam as said first beam (Claim 21 also suffers from a similar deficiency).

3. Claim 2 recites: "... wherein said first means ..." Examiner notes, there is no antecedent basis for this term.

4. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, claim 20 merely recites the presence of device elements. The claimed system lacks language that illustrates an inter-relation and functionality amongst the recited elements.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2882

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-4, 7,8 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Applicant's Admitted Prior Art (herein referred to as AAPA).

8. As per claims 1 and 21, AAPA discloses an apparatus (100) (and method) comprising a means (108) for providing a first beam of electromagnetic energy (135); a second means (146) for sampling the first beam and providing a second beam (137) in response thereto; a third means (136) for detecting aberrations in the second beam (137); and a fourth means responsive to the detected aberrations, for correcting aberrations in the first beam (see Fig. 1 - Prior Art 126, PBS, 130, 132; specification: p.8, lines 10-32, p. 9, lines 1-23).

9. As per claims 2-4, AAPA discloses an apparatus wherein the first means is a telescope and includes a primary mirror (see Fig. 1 - Prior Art).

10. As per claim 8, AAPA discloses an apparatus wherein third means is a wave-front sensor adapted to detect aberrations in the second beam and to provide a first signal error in response thereto (see Fig. 1 - Prior Art; specification: p.8, lines 10-32, p. 9, lines 1-23).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 5, 6 and 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (herein referred to as AAPA).

13. As per claims 5 and 6, AAPA does not explicitly disclose an apparatus comprising a holographic element disposed on a surface of the primary mirror.

14. It would have been obvious to modify the apparatus of AAPA such that it incorporated a holographic element disposed on a surface of the primary mirror. One would have been motivated to make such a modification based on the conventional understanding that holographic optical elements are useful in defining and implementing the interconnection patterns between sources and detectors. An additional benefit of using holographic optical elements rather than electrical connections, optical fibers or conventional mirrors is that HOEs allow greater freedom in designing optical system interconnections and enable the conversion of a single beam into separate beams of uniform energy and specific shape. The use of these optical elements is noted for their high conversion efficiency, which in turn lowers system power requirements and operation costs.

15. As per claims 9-20, AAPA does not explicitly disclose an apparatus comprising processing means, optical phase arrays and means for phase conjugation.

16. It would have been obvious to modify the apparatus of AAPA such that it incorporated the aforementioned elements. One would have been motivated to make such a modification so that the apparatus is provided with means for receiving and manipulating system information to be used for automatic adjustments in response to the processed data. Such a system would not require manual manipulation of elements for recalibration. Additionally, it would have been obvious to incorporate optical phase arrays and means for phase conjugation, since it is commonly understood that optical phase arrays assist in the steering of radiation and alignment with corresponding elements in an optical system. A benefit of such a modification is that it ensures the propagation of radiation such that loss is minimized between interconnects. It would have been obvious to further incorporate optical phase conjugation means for the purpose of unraveling distortions that occur as radiation propagates through a distorting medium, thereby increasing the efficiency of the system and minimizing the need for amplifying means to enhance detection of radiation.

Response to Arguments

17. Applicant's arguments filed 6.16.03 have been fully considered but they are not persuasive. In particular, Applicant's Admitted Prior Art (herein referred to as AAPA) discloses an apparatus (100) (and method) comprising a means (108) for providing a first beam of electromagnetic energy (135); a second means (146) for sampling the first beam and providing a second beam (137) in response thereto; a third means (136) for detecting aberrations in the second beam (137); and a fourth means responsive to the detected aberrations, for correcting aberrations in the first beam (see Fig. 1 - Prior Art 126, PBS, 130, 132; specification: p.8, lines 10-32, p. 9, lines 1-23). Examiner has applied the "broadest reasonable interpretation" in determining the means plus function limitation recited in the independent claims and has concluded that the means plus function elements recited in AAPA constitute functional equivalents, and therefore meet the claimed limitations as noted above (see also MPEP 2181). Examiner further notes that applicants' arguments relating to the operability of the claimed invention (i.e. "...invention provides an integrated phase conjugate laser and adaptive optics control architecture that does not require target loop wave-front sensing and employs outgoing wave-front sampling of the primary beam detector mirror...") are not positively recited in the independent claims and more importantly rely on latent properties of the system and method to prove novelty over the art of record (see MPEP 2145 sections I, II and IV).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (703) 306-0473. The examiner can normally be reached on M - F (9 am - 5 pm).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (703) 308 4858. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Art Unit: 2882

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

CT

Courtney Thomas



EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER